Table 1. Primary habitat and the species of woody plants selected for nest sites by the loggerhead shrike, as documented in studies across the species' range.

STUDY	STATE/ PROVINCE	PRIMARY HABITAT USED	PRIMARY NESTING SUBSTRATE(S)
Brooks 1988	Minnesota	agricultural, grasslands	44% eastern red cedar, 21% thorn-bearing trees, 12% spruce. (N=48 nests)
Burton and Whitehead 1990	Indiana	short grass, agricultural	142 nests in 34 plant species: 40% eastern red cedar; 12% multiflora rose; 9% sassafras
Campbell 1975 (cited in Novak 1989)	Ontario	agricultural/pasture	111 of 167 nests in hawthorn
Cely and Corontzes 1986	South Carolina	residential lawns	26% eastern red cedar, 24% evergreen oaks, 21% loblolly pine. (N=34 nests).
Chavez-Ramirez 1998	Texas	urban park-like settings	90% in oaks or hackberry. (N=28 nests).
Collins 1996	Illinois	old field, grassland	27% multiflora rose, 15% eastern red cedar, 12% shingle oak. (N=26 nests)
DeGeus 1990	Iowa	roadsides in agricultural landscape	58% white mulberry, 20% American plum, 16% eastern red cedar. (N=159 nests)
Gawlik and Bildstein 1990	South Carolina	pasture, hay field, lawn	63% eastern red cedar. (N=49 nests)
Graber et al. 1973	north/central Illinois	roadside hedges in agricultural area	88% osage orange. (N=89 nests)
Graber et al. 1973	southern Illinois	roadside hedges in agricultural area	55 nests in 16 plant species: 20% eastern red cedar; 13% multiflora rose; 11% osage orange
Kridelbaugh 1982	Missouri	pasture, old field	58% eastern red cedar, 12% multiflora rose. (N=60 nests)

Table 1 (continued). Primary habitat and the species of woody plants selected for nest sites by the loggerhead shrike, as documented in studies across the species' range.

STUDY	STATE/ PROVINCE	PRIMARY HABITAT USED	PRIMARY NESTING SUBSTRATE(S)
Leu and Manuwal 1996	Washington	ravines in shrub-steppe	76% Wyoming big sagebrush, 8% greasewood, 7% mock orange. (N=108 nests)
Luukkonen 1987	Virginia	active pasture	47% eastern red cedar, 25% hawthorn. (N=75 nests)
Michaels 1997	Kansas	tallgrass prairie with scattered woody vegetation	8 nests: 4 in osage orange; 2 in eastern red cedar; 2 in white mulberry
Mossman and Lymn 1989	Wisconsin	roadside, railroad right-of-way, pasture, old field	½ of Wisconsin nest records from 1980-1989 in eastern red cedar
Novak 1989	New York	agricultural/pasture	16 of 17 nests in hawthorn
Poole 1992	Washington	shrub-steppe	big sagebrush and antelope bitterbrush most frequently used
Porter et al. 1975	Colorado	shortgrass prairie, pasture	77 nests: 70% in elm, willow, cottonwood, Russian olive
Smith 1990	Illinois	pasture, hay field	32 nests in 14 plant species; most used species was eastern red cedar (18% of nests)
Tyler 1994	Oklahoma	pasture	133 nests in 23 plant species: 31% osage orange; 13% hackberry; 11 % Chinese elm
Woods and Cade 1996	Idaho	shrub-steppe	65% sagebrush, 20% bitterbrush, 12% greasewood. (N=162 nests)
Yosef 1992a	Florida	pasture, fencelines	36% cabbage palm, 36% blackberry. (N=64 nests).

Table 2. Productivity of loggerhead shrikes as documented in studies across the species' range.

STUDY	STATE/ PROVINCE	TOTAL # OF NESTS	AVERAGE CLUTCH SIZE (N)[1]	% NEST SUCCESS[2] (N)[1]	YOUNG FLEDGED/ SUCCESSFUL NEST (N)[1]
Anderson and Duzan 1978	Illinois	13	5.2	72	3.9
Blumton 1989	Virginia	32	5.2	55 (19)	3.6 (19)
Brooks and Temple 1990b	Minnesota	46	5.7	73 (61)	NA[3]
Burton and Whitehead 1990	Indiana	107	5.7	57	4.6
Cely and Corontzes 1986	South Carolina	34	NA[3]	68	4.5 (23)
Chavez-Ramirez 1998	Texas	28	5.5	60	2.9
Collins 1996	Illinois	21	5.3	25	NA[3]
DeGeus 1990	Iowa	222	5.6	35	4.7
Gawlik and Bildstein 1990	South Carolina	49	5.3	65	4.7
Kridelbaugh 1982	Missouri	55	5.7	69	4.4
Leu and Manuwal 1996	Washington	110	median=6	66	NA[3]
Luukkonen 1987	Virginia	57	5.1 (53)	62	4.0 (46)
Novak 1989	New York	5	5.6	50	3.5
Poole 1992	Washington	59	5.9 (35)	57 (59)	5.1 (17)
Porter et al. 1975	Colorado	77	6.4	66	5.4
Siegel 1980	Alabama	37	5.0	43	4.0
Smith 1990	Illinois	32	NA[3]	44	3.2
Woods 1995b	Idaho	120	6.1 (84)	61 (112)	5.1 (65)
Yosef 1992a	Florida	64	3.8	42 (28)	NA[3]

1 N=sample size; indicated if different from "Total # of Nests."
2 Nest success was generally % of nests which successfully fledged at least one young. Note that not all authors indicated how nest success was calculated, and technique may differ among studies.
3 NA=Not Available

Table 3. State status, Breeding Bird Survey (BBS) trends, and Christmas Bird Count (CBC) trends for the loggerhead shrike in the continental United States.

STATE	STATE STATUS[1]	BBS TREND 1966-1998				CBC TREND 1959-1988			
		TREND[2]	P[3]	N[4]	RA[5]	TREND[2]	P[3]	N[4]	RA[5]
U.S. FISH AND WILDLIFE SERVICE REGION 1									
California	SC	-2.0	*	106	2.91	-1.3	**	130	3.49
Idaho	SC	-8.8	0.22	14	1.08	NA			
Nevada	Protected	-7.9	***	32	2.18	NA			
Oregon	SC	-3.4	**	21	0.83	1.5		27	0.23
Washington	Candidate	NA				-4.2	**	14	
U.S. FISH AND WILDLIFE SERVICE REGION 2									
Arizona		-4.5	*	42	2.16	-2.3	**	46	2.96
New Mexico		-6.9	***	50	3.50	-0.8		28	2.68
Oklahoma	SC	-4.9	***	57	3.34	-1.5	**	25	4.59
Texas		-3.7	***	124	2.66	-1.3	**	124	8.97
U.S. FISH AND WILDLIFE SERVICE REGION 3									
Illinois	T	-5.4	*	34	0.46	0.3		43	0.92
Indiana	E	NA				-0.7		23	0.10
Iowa	SC	-10.0	***	19	0.54	0.4		20	0.19
Michigan	E	NA				-0.6		16	0.02
Minnesota	T	NA				NA			
Missouri	WL	-7.0	***	48	1.74	-2.0	***	36	1.50
Ohio	E	NA				-0.5		28	0.04
Wisconsin	E	NA				NA			
U.S. FISH AND WILDLIFE SERVICE REGION 4									
Alabama		-7.6	***	71	1.90	-4.4	***	23	3.69
Arkansas		-7.5	***	28	1.49	-2.4	***	21	4.53
Florida		-3.2	***	73	5.55	-2.9	***	62	5.55
Georgia		-1.3	0.39	53	2.36	-2.0		29	4.43
Kentucky		-6.4	***	29	0.95	-0.6		17	1.07
Louisiana		-0.7	0.53	45	5.90	-0.6		23	8.38
Mississippi		-4.8	**	33	2.38	-2.0	*	18	4.79
N. Carolina	SC	-15.2	***	24	0.95	-6.6	***	44	2.03
S. Carolina	SC	-3.5	***	24	1.89	-4.3	***	18	3.26
Tennessee		-7.4	***	35	1.52	-1.2		29	3.01

Table 3 (continued). State status, Breeding Bird Survey (BBS) trends, and Christmas Bird Count (CBC) trends for the loggerhead shrike in the continental United States.

STATE	STATE STATUS[1]	BBS TREND 1966-1998				CBC TREND 1959-1988			
		TREND[2]	P[3]	N[4]	RA[5]	TREND[2]	P[3]	N[4]	RA[5]
U.S. FISH AND WILDLIFE SERVICE REGION 5									
Connecticut	(1 nest record)	NR				NA			
Delaware	(1 nest record)	NR				NA			
Maine	SC (last rec. 1963)	NA				NA			
Maryland	E	NA				-2.4	***	21	
Massachusetts	E (last rec. 1971)	NR				NA			
New Hampshire	E	NR				NA			
New Jersey	E	NR				-1.0		16	
New York	E	NA				-0.2		21	0.15
Pennsylvania	E	NA				0.5		21	0.08
Rhode Island	(no nest records)	NR				NA			
Vermont	E (last rec. 1978)	NR				NA			
Virginia	T	-6.3	0.31	18	0.21	-4.0	***	52	0.66
West Virginia	SC	NA				NA			
U.S. FISH AND WILDLIFE SERVICE REGION 6									
Colorado		3.7	0.11	42	1.75	-2.6	***	20	0.35
Kansas		-2.3	**	39	3.42	-1.1		39	1.16
Montana		0.00	0.99	24	1.46	NA			
Nebraska		-0.9	0.79	42	1.77	NA			
North Dakota		-0.7	0.71	26	0.97	NA			
South Dakota		-0.5	0.70	36	1.71	NA			
Utah		4.7	0.28	29	1.35	-1.4	**	16	0.88
Wyoming		-1.4	0.53	60	1.21	NA			

1 STATE STATUS: E=endangered, T=threatened, SC=special concern, WL=watch list. A blank indicates no specific designation in the state. Notations in parenthesis refer to the total number of nesting records or the last nesting record.
2 TREND: average percent annual change; NA=inadequate sample size; NR=no BBS records
3 P: statistical significance of the trend (probability that the trend is equal to zero):
* = $0.05 \leq P < 0.10$; ** = $0.01 \leq P < 0.05$; *** = $P < 0.01$
Blank indicates that $P > 0.10$ for CBC; for BBS trends, P values ≥ 0.10 are reported.
4 N: number of routes (counts) used in the analysis
5 RA: relative abundance (mean number of birds recorded per route per year)

Table 4. Threats to loggerhead shrike populations reported by state natural resource agencies and/or species experts. (Note that an answer of yes does not necessarily indicate that the factor is a documented threat to the continued existence of the species in the state, but that the factor has been or is potentially a cause of population declines). "Not noted" indicates that a particular threat was not noted; "not reported" indicates that no information was provided regarding threats. See Appendix I for details.

STATE	HABITAT	OVER-UTILIZATION	DISEASE/ PREDATION	REGULATORY	OTHER
U.S. FISH AND WILDLIFE SERVICE REGION 1					
California	yes	unknown	unknown	unknown	unknown
Idaho	yes	not noted	not noted	not noted	not noted
Nevada	not noted	not noted	not noted	not noted	pesticides
Oregon	yes	not noted	not noted	not noted	not noted
Washington	yes	not noted	not noted	not noted	not noted
U.S. FISH AND WILDLIFE SERVICE REGION 2					
Arizona	yes	unknown	unknown	unknown	pesticides
New Mexico	unknown	no	no	no	pesticides
Oklahoma	yes	no	no	no	vehicles
Texas	yes	no	predation[a]	not noted	pesticides/vehicles
U.S. FISH AND WILDLIFE SERVICE REGION 3					
Illinois	yes	no	no	yes[b]	pesticides
Indiana	yes	no	predation[a]	yes[b]	yes[c]
Iowa	not noted	not noted	predation[a]	not applicable	not noted
Michigan	yes	no	no	no	low density[c]
Minnesota	yes	no	no	no	pesticides
Missouri	yes	no	no	no	no
Ohio	yes	not noted	not noted	not noted	not noted
Wisconsin	yes	no	no	no	pesticides
U.S. FISH AND WILDLIFE SERVICE REGION 4					
Alabama	yes	not noted	not noted	not noted	pesticides
Arkansas	yes	not noted	not noted	not noted	not noted
Florida	yes	no	no	not noted	pesticides/vehicles
Georgia	yes	not noted	not noted	not noted	pesticides
Kentucky	no	no	no	no	no
Louisiana	yes	not noted	not noted	not noted	pesticides
Mississippi	not reported	not reported	not reported	not reported	not reported
N. Carolina	yes	no	disease	not applicable	pesticides
S. Carolina	yes	not noted	not noted	not noted	not noted
Tennessee	yes	not noted	not noted	not noted	not noted

Table 4 (continued). Threats to loggerhead shrike populations reported by state natural resource agencies and/or professionals. (Note that an answer of yes does not necessarily indicate that the factor is a documented threat to the continued existence of the species in the state, but that the factor has been or is potentially a cause of population declines). See Appendix I for details.

STATE	HABITAT	OVER-UTILIZATION	DISEASE/ PREDATION	REGULATORY	OTHER
U.S. FISH AND WILDLIFE SERVICE REGION 5					
Connecticut	not noted	not noted	not noted	not noted	not noted
Delaware	not applicable	not applicable	not applicable	not applicable	not applicable
Maine	yes	not noted	not noted	no	not noted
Maryland	yes	not noted	not noted	not noted	vehicles
Massachusetts	not reported	not reported	not reported	not reported	not reported
New Hampshire	not noted	not noted	not noted	not noted	not noted
New Jersey	not reported	not reported	not reported	not reported	not reported
New York	yes	no	no	no	yes[c]
Pennsylvania	yes	yes	no	yes[b]	not noted
Rhode Island	not noted	not noted	not noted	not noted	not noted
Vermont	not reported	not reported	not reported	not reported	not reported
Virginia	yes	no	predation[a]	no	unknown
West Virginia	yes	not noted	predation[a]	not noted	pesticides
U.S. FISH AND WILDLIFE SERVICE REGION 6					
Colorado	yes	not noted	not noted	not noted	pesticides/weather
Kansas	yes	not noted	not noted	not noted	not noted
Montana	yes	no	no	no	pesticides
Nebraska	not reported	not reported	not reported	not reported	not reported
North Dakota	yes	not noted	not noted	not noted	pesticides
South Dakota	yes	not noted	not noted	not noted	pesticides
Utah	yes	no	no	no	no
Wyoming	no	no	no	no	no

a: Texas - predation may be a problem for urban shrikes
Indiana, Iowa - predation may be exacerbated because shrikes favor linear roadside habitats
Virginia, West Virginia - predation by raptors in winter may be a major cause of mortality
b: No existing regulatory mechanism to protect habitat, even though the species is state endangered
c: Indiana - vehicles, pesticides, inter-specific competition
Michigan - shrike population density too low for males to find mates
New York - vehicles, pesticides, weather

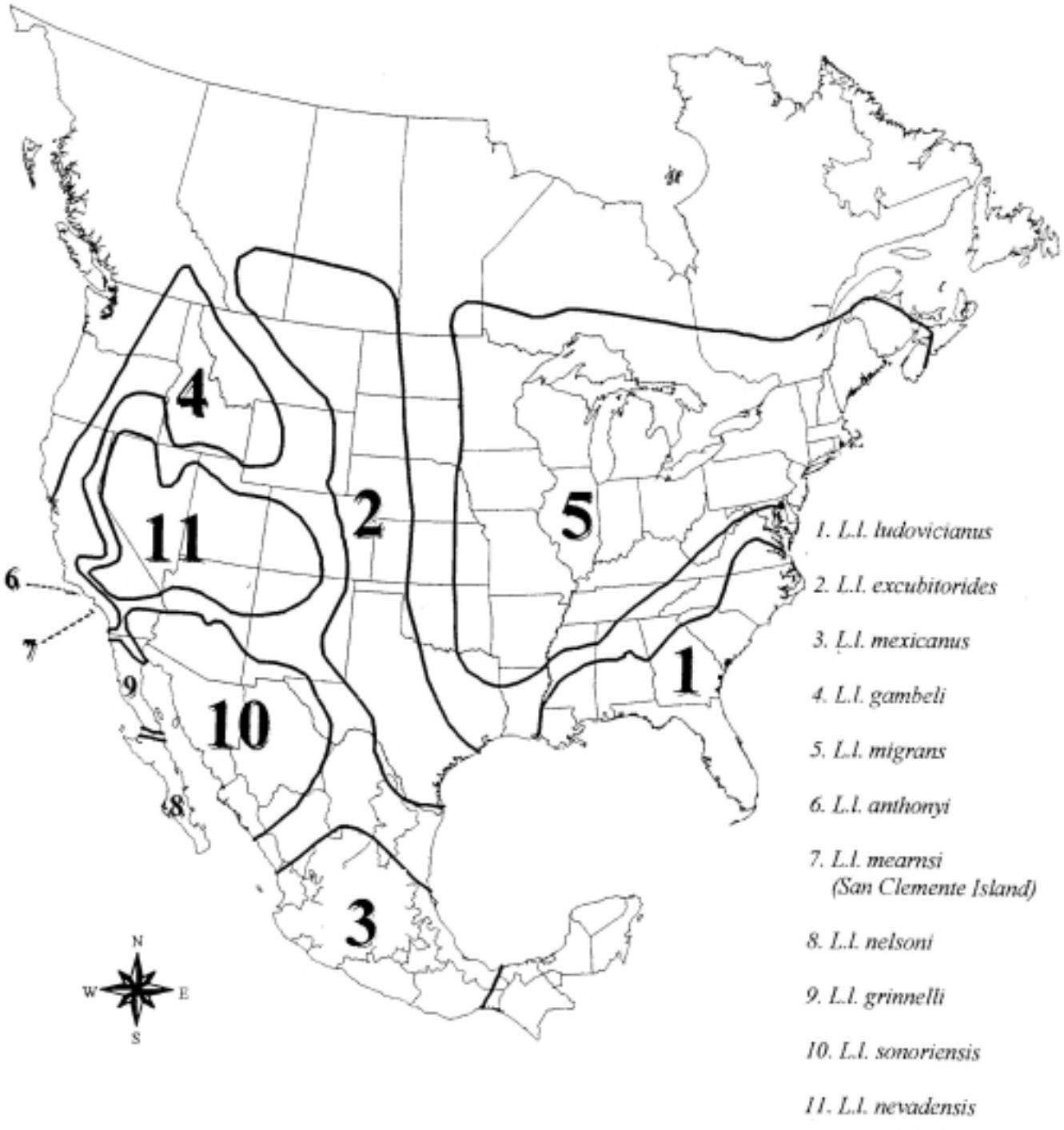

Figure 1. Breeding ranges of 11 subspecies of loggerhead shrike (Lanius ludovicianus) based on Miller (1931). Areas between adjacent subspecies are potential zones of intergradation.